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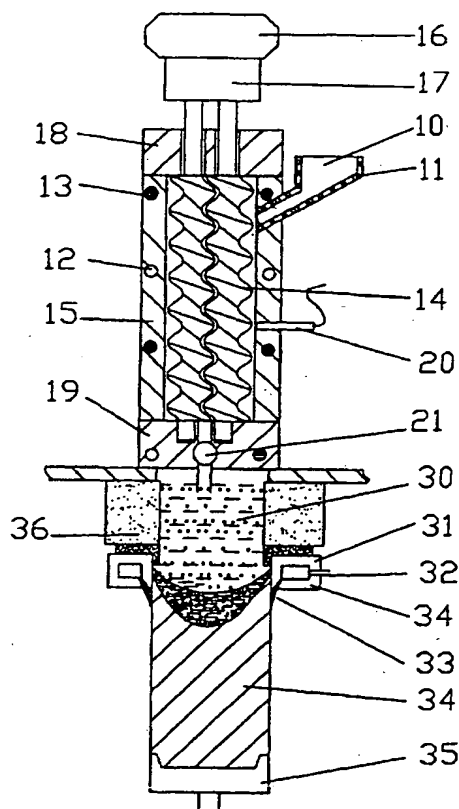
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- (71) Applicant (for all designated States except US): **BRUNEL UNIVERSITY** [GB/GB]; Uxbridge, Middlesex UB8 3PH (GB).
- (72) Inventors; and
(75) Inventors/Applicants (for US only): **FAN, Zhongyun** [CN/GB]; Brunel University, Uxbridge, Middlesex UB8 3PH (GB). **Ji, Shouxun** [CN/GB]; Brunel University, Uxbridge, Middlesex UB8 3PH (GB). **BEVIS, Michael, John** [GB/GB]; Brunel University, Uxbridge, Middlesex UB8 3PH (GB).
- (74) Agent: **TOLLETT, Ian**; Williams, Powell & Associates, 4 St. Paul's Churchyard, London EC4M 8AY (GB).
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[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR MAKING METAL ALLOY CASTINGS



(57) Abstract: A method and apparatus are provided for fabricating of continuous castings with fine and uniform microstructure, which can be used as feedstock for secondary processing routes, such as thixoforming, forging and machining or direct application in industry. An overheated liquid alloy is fed into a high shear device (for example, a twin-screw extruder) and sheared intensively to produce a sheared liquid alloy or a semisolid slurry, wherein the sheared liquid alloy is at a temperature close to its liquidus and the semisolid slurry is then transferred to a shaping device for production of continuous castings with fine and uniform microstructures through a solidification process. The shaping device is any device capable of forming continuous (i.e. infinite length) products, such as a direct chill (DC) caster (2) (DC rheocasting) for production of continuous billets, an extrusion die (8) (rheo-extrusion) for production of continuous bars or wires, or a twin-roll caster (twin-roll rheocasting) for producing of continuous strips. In all those cases, the cross-section of the continuous castings exhibits a microstructure in which a controlled volume fraction of fine and spherical primary particles are uniformly distributed in a fine structured matrix.

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INTERNATIONAL SEARCH REPORT

International Application No

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A. CLASSIFICATION OF SUBJECT MATTER
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B22D C22C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>TISSIER A ET AL: "MAGNESIUM RHEOCASTING: A STUDY OF PROCESSING-MICROSTRUCTURE INTERACTIONS"</p> <p>JOURNAL OF MATERIALS SCIENCE, CHAPMAN AND HALL LTD. LONDON, GB;</p> <p>vol. 25, no. 2B,</p> <p>1 February 1990 (1990-02-01), pages 1184-1196, XP000541387</p> <p>ISSN: 0022-2461</p>	1, 5, 12, 13
Y	<p>page 1184, right-hand column, last paragraph -page 1185, left-hand column, line 2; figure 2</p> <p style="text-align: center;">--- -/--</p>	2-4, 6-8, 11, 14-16

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☒ Patent family members are listed in annex.

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Mailliard, A

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 013, no. 296 (M-846), 10 July 1989 (1989-07-10) & JP 01 087041 A (ISHIKAWAJIMA HARIMA HEAVY IND CO LTD), 31 March 1989 (1989-03-31) abstract	1,5, 11-13
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P,Y	GB 2 354 471 A (UNIV BRUNEL) 28 March 2001 (2001-03-28) abstract; figure 1	2-4,11, 14-16

INTERNATIONAL SEARCH REPORT

I
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GB 2354472	A	28-03-2001	AU 7432200 A WO 0123124 A1	30-04-2001 05-04-2001
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